



Climate change and future temperature-related mortality in 15 Canadian cities

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Abstract:

The environmental changes caused by climate change represent a significant challenge to human societies. One part of this challenge will be greater heat-related mortality. Populations in the northern hemisphere will experience temperature increases exceeding the global average, but whether this will increase or decrease total temperature-related mortality burdens is debated. Here, we use distributed lag modeling to characterize temperature-mortality relationships in 15 Canadian cities. Further, we examine historical trends in temperature variation across Canada. We then develop city-specific general linear models to estimate change in high- and low-temperature-related mortality using dynamically downscaled climate projections for four future periods centred on 2040, 2060 and 2080. We find that the minimum mortality temperature is frequently located at approximately the 75th percentile of the city's temperature distribution, and that Canadians currently experience greater and longer lasting risk from cold-related than heat-related mortality. Additionally, we find no evidence that temperature variation is increasing in Canada. However, the projected increased temperatures are sufficient to change the relative levels of heat- and cold-related mortality in some cities. While most temperature-related mortality will continue to be cold-related, our models predict that higher temperatures will increase the burden of annual temperature-related mortality in Hamilton, London, Montreal and Regina, but result in slight to moderate decreases in the burden of mortality in the other 11 cities investigated.

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Resource Description

Climate Scenario :

specification of climate scenario (set of assumptions about future states related to climate)

Special Report on Emissions Scenarios (SRES)

Special Report on Emissions Scenarios (SRES) Scenario: SRES A2

Exposure :

weather or climate related pathway by which climate change affects health

Temperature

Temperature: Extreme Cold, Extreme Heat, Fluctuations

Geographic Feature:

Climate Change and Human Health Literature Portal

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☒

resource focuses on specific location

Non-United States

Non-United States: Non-U.S. North America

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Morbidity/Mortality

Model/Methodology: ☒

type of model used or methodology development is a focus of resource

Exposure Change Prediction, Outcome Change Prediction

Resource Type: ☒

format or standard characteristic of resource

Research Article

Timescale: ☒

time period studied

Long-Term (>50 years)